



DOCUMEN	T TITLE/DESCF	RIPTION:	STAGING, STORAGE, SIZING, AND TREATMENT FACILITY (SS DOE/ID-10825, November 2000	SSTF) DRAFT 30 % DESIGN
DATE :1	1/29/2000	REVIEWER:	<u>EPA</u>	
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GENERAL (COMMENTS			
1)		General	Concern:	
			A dust suppression for the treatment process in the SSSTF is proposed to be accomplished using a water misting system. However, no details are provided.	No change for the 30% design. Issue will be addressed in the RD/RA Work Plan.
	·		Suggested Change/Explanation:	
			The following specific details of this misting system should be included:	
			The proposed water mist application rate;	
			Mechanisms to collect misted water, and whether this water will be recycled, stored, disposed, or otherwise handled. If disposed, the dust entrained in it should be removed before disposal, and this removal mechanism should be detailed; and	
			How to determine the amount of water added via misting to the treatment recipe, so that the water for the recipe can be adjusted accordingly.	
2)		General	This 30% design shows that a mixing basin will be used to mix wastes with stabilizing materials. However, no description is provided on how this basin will be rinsed or cleaned out between batches, and how secondary wastes will be disposed or handled after use. Without a cleaning process between batches, there is the potential for incompatible materials to come into contact with one another. Also, adding a cleaning method for each batch will change the amount of time needed for each batch.	No incompatible wastes are currently identified. No change for the 30% design. Clarification of how the basin will be cleaned will be addressed in the RD/RA Work Plan.



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3)	·	General	Two missing critical pieces of information are: (1) the waste acceptance criteria (WAC) for the ICDF to determine the standards that the treated waste from the SSSTF must achieve; and (2) the treatability study for the treatment unit should be conducted to establish a design basis for waste loading and reagents to be used; this treatability study, although partially described, does not, as yet, have a schedule.	No change to the 30% design. A White Paper will be submitted to the Agencies to identify the impact of the missing information. The paper will address an optimal approach for the ICDF and SSSTI as a whole, given the planned schedule for the WAC and Treatability Study information. The Treatability Study will be performed at bench scale. And the loading and reagents will be scaled up from this basis.
4)		General	The Preliminary Design Report (Sections 4.1.2.1 and 4.2.1) indicates that no subsurface investigation and no life-cycle analyses will be done until 90% design. This submittal is, therefore, conceptual for the purposes of establishing a baseline only. Specification calls for parallel flanges. Also, the collateral loads listed do not appear to apply to this project. Finally, clarify what is provided (i.e., furnished and installed) under this Section versus what, if anything, is only installed. (PDS) The following general comments are noted: a) The Architectural and Structural Drawings imply that all three building superstructures will be metal building systems. However, the Cost Estimate indicates that the Treatment Facility will be a conventional steel-framed building. Please clarify. b) Specification Section 05100 does not list Treatment Facility framing under "Section Includes". Similar to Comment 1, please clarify whether the Treatment Facility will be a conventional steel-framed building.	No changes for the 30% Design. DOE believes there is sufficient geotechnical data available to design the building in accordance with the DOE A&I Standards for INEEL. The RD/RA Work Plan will include calculations and will demonstrate how loading requirements in the DOE A&E Standards will be met. a, b, and c, will be clarified in the RD/RA Work Plan.



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			c) Specification Section 13120 is not coordinated with the work shown on the drawings. Under "Section Includes," two (or three) buildings should be listed. The drawings show tapered-flange columns, and the	
SPECIFIC	COMMENTS—	Those comments	marked with an "**" are considered by Wayne Pierre, to be critical	l issues for resolution.
5)**	Page 24	EDF 1540, Section 7.0	The text state that "Purge and development water will be stored in tanks at the Staging and Storage Annex until the ICDF becomes available for disposal of the water." This will entail the storage and maintenance of tens of thousands of gallons of contaminated groundwater in a system of tanks requiring spill prevention and/or leak detection systems, a heating system, and a means to segregate wastes by contaminant and/or concentrations. The text does not include any details of the configuration of the tanks. Details such as the proposed number of tanks, their sizes, and the types of expected contaminants and concentrations for this tank system, should be included. Monitoring systems and secondary containment specifics should also be provided.	No changes to the 30% Design. This is addressed in the waste management plan for SSA. The ICDF does not plan to store water, only discharge to the evaporation pond. Any water storage (tankage or other) for leachate collection will be held for sampling before disposal to the EP and will be addressed in the ICDF Design documents.
6)	<u>Page 24</u>	EDF 1540, Section 7.0	The text does not discuss whether volume reduction of the purge waters or other types of contaminant immobilization through sorption or stabilization were considered or will be considered as a contingency plan. Details are needed on the ability to expand the tank system as it is proposed, or include a waste minimization plan if additional water storage capacity becomes necessary to support of the drilling and sampling program.	No changes to the 30% Design. Water storage is an interim activity until the ICDF is operational. The evaporation pond was selected in the ROD as the treatment unit. For the Group 5 purge water, water quality data from existing wells will be used to document that this water meets the EP WAC. The available data indicate that this water can go to the EP.



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7)	Page 10	EDF 1542, Section 4.4.	This section states that equipment will have a design basis of no more than 20% downtime. It needs to be clarified which equipment this downtime design basis refers to.	No changes to the 30% Design. Issue will be addressed in the RD/RA Work Plan.	
8)**	<u>Page 16</u>	EDF 1542, Fig 7-1.	This figure shows the stabilization process flow. An arrow in this figure shows stabilized wastes going from the sizing/mixing/blending unit to a staging area. However, a small set of arrows bypasses the staging area, and leads directly to the landfill. Clarification is needed on whether some of the stabilized wastes is proposed to be transferred directly to the landfill rather than being staged first, and state the criteria used to determine this direct transfer to the landfill.	No changes to the 30% Design. The frequency of sampling will be presented in the RD/RA Work Plan, and will be resolved in future Agency discussions.	
			The following general comments are noted: Due to QA sampling concerns it is not likely that wastes will proceed directly to the landfill.		
9)	<u>Page 17</u>	EDF 1542, Table 8-1.	Table 8-1 apparently shows stabilization recipes and results that have worked at other, unspecified, facilities for concentrations similar to those expected at the SSSTF. However, whether these recipes come from other facilities, or within INEEL, is not entirely clear, and should be clarified. Wherever these recipes have been used, this table should reference the documents where these data were derived.	Clarification will be made in the 30% design. The reference for all the recipes is provided in Table 8-1 footnote B and has been added to the second sentence of the first paragraph of Section 8. The reference is #10 in Section 13 – References.	



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10)	<u>Page 20</u>	EDF 1542, Section 9.	This section lists stabilization process considerations. The time needed for a recipe to set prior to collecting a TCLP sample should be added to this list, since this time will affect the overall time needed for the process.	Clarification will be made in the 30% design. A bullet was added to the process consideration stating: "The time required for the stabilization chemical reactions to complete and the product to "cure" may be an important consideration for sampling, staging, storage, and transport scenarios.		
		·	·	At this time the amount of time for the stabilized waste to cure is not known. A better grasp of the length of cure time required will be provided during the treatability study.		
11)	<u>Page 24</u>	EDF 1542, Section 11.1.	Throughput sizing calculation assumptions presume that there are only six productive hours per ten hour shift. This assumption should be justified.	Clarification was made in the 30% design. Text was added to indicate this is a programmatic assumption.		
12)	Page 25	EDF 1542, Section 11.1.	Throughput sizing calculations assumptions state that there are an anticipated 9 months (150 days) of productivity per year. This assumption should be justified.	Clarification was made in the 30% design. Text was added to indicate this is a programmatic assumption.		
				Winter weather will not allow for excavation.		
13)	Page 9	EDF 1543, Section 1.2.	This section, which lists waste transportation system assumptions, should list that US Department of Transportation regulations will be conformed to.	No change to the 30% design. DOE Orders are referenced which in turn invoke US DOT regulations. This issue will be addressed in more detail in the RD/RA Work Plan.		



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14)	Page 7	EDF 1545, Section 2.1.		items showing the flow of de the curing time needed		Clarification will be made to the 30% design. In bullet six, first sentence, the text was revised to state "placed in roll-on/roll-off (RO/RO) containers and allowed to cure."
						Cure times will be evaluated in further detail based on the treatability study.



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15)**	<u>Page 13</u>	EDF 1547, Figure 2-3.	This figure shows the SSSTF decision diagram. This figure shows that all liquid waste will go to the ICDF evaporation pond without prior sampling or analysis. The following general comments are noted: The ICDF evaporation pond's waste acceptance criteria (WAC) would be needed to justify this assumption and the figure still requires an insert of sampling and analysis in this flow diagram to meet that WAC.	Clarification will be added to the 30% design. Figure 2-3 was revised to show that the wastewater going to the EP will meet the EP WAC or be treated as necessary to meet the EP WAC. The EP WAC is needed to make this decision. Data will be available for purge water by the time the EP is open. Sampling and analysis of other waste streams (leachate) will be accounted for in the ICDF design documents. The current assumption is that all liquid waste (both primary and secondary) will meet the WAC. Only waste that has been verified to meet the WAC will be accepted at the SSSTF. At this time, it appears that all secondary wastes will meet the WAC. If there are any special cases or changes to the current knowledge, the liquid wastes will be handled as a contingency. Contingency procedures will be developed for Off-Normal Events in the SSSTF Operating Procedures.	

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16)	Page 13	EDF 1547, Figure 2-3	This figure shows that stabilization is followed by TCLP sampling and analysis; failure to meet TCLP criteria causes insufficiently stabilized material to loop back through the stabilization process. The text, or this figure, should explain how many iterations of this stabilization loop will occur before the process is determined to have failed; also, what would happen next after the stabilization failed.	Clarification will be made in the 30% design. Text was added to Section 2.2, Decision Diagram, stating: "Note that there is not a possibility of getting into an infinite loop of treatment/fail TCLP in the decision matrix. Based on experience at other sites, it is anticipated that treating waste will require at most 2 – 3 times through the process." The last sentence added to Section 2.2 was also added as a note in Figure 2.3.	
				From a practical standpoint, looping back will occur only a couple of times. Provision is made for a return of stabilized waste if, for example, the recipe was wrong and the waste failed TCLP; then another attempt at stabilization could be made. This will be clarified on the figure.	
17)	<u>Page 15</u>	EDF 1547, Figure 2-5, Also, 2-6 & 2-7	This figure shows the stabilization process flow. Flow rates and volumes are tabulated at the bottom left corner for some streams, but not all. These flow rates and values should be provided for all streams as sufficient information becomes available.	Clarification will be made in the 30% design. A note was added to Figures 2-5, 2-6 and 2-7 stating: "Values will be filled in as they become available." However, when the values in the table are not applicable, or not considered important, they will not be calculated. The EDF also states that these figures are a work in progress.	
18)	Page 18	EDF 1547, Table 2-1	This table shows the anticipated schedule for waste shipment to the ICDF. The column labeled "Treatment" should be labeled "Anticipated Treatment."	Clarification will be made in the 30% design. The column heading was changed to "Anticipated Treatment".	



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19)	<u>Page 26</u>	EDF 1547, Section 2.4.6.1	The text in this section discusses landfill waste design processing rates. The text shows how the required minutes per load were calculated so that the process could accommodate the year with this maximum annual loading. The rate needed to accommodate that year as 9.5 minutes per load. However, not all processes were included in this calculation. For example, trucks will need to be decontaminated and released, and this is not included in this calculation. At 9.5 minutes per load, how many truck decontamination stations will be needed so that truck decontamination doesn't slow the process down?	No change to the 30% design. A re-evaluation of the time and motion studies will be performed for the RD/RA Work Plan. An operations manager has been added to the team to help ensure that the processing times and manpower estimates are accurately estimated. For the specific example mentioned, it is assumed that approximately 5% of the trucks will require decontamination.
20)	<u>Page 27</u>	EDF 1547, Section 2.4.6.4	This section discusses how SSSTF storage space requirements were calculated. A total of 24 spaces for loads were calculated. Further information is needed to support that this amount of space will accommodate the waste received during the three months every year when the SSSTF is not operational.	No change to the 30% design. The design assumption is that waste will not be generated during the three months of the year the ICDF Complex is not operational (i.e., during the winter months). Therefore, additional space will not be required during this time. This issue will be addressed in the RD/RA
				Work Plan. hen facility is not operational.
21)	<u>Page 29</u>	EDF 1547, Table 2-9	This table shows the anticipated manpower requirements for the SSSTF. Again, no time is allowed for waste to cure or set prior to collecting samples for TCLP analysis. This may affect manpower requirements, and it should be included.	See Resolution to Comment #19.



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22)	<u>Page 17</u>	EDF 1551, Section 2.3.2.4	This section discusses potential listed wastes. One bullet states "Listed wastes are source dependent-the mere existence of a particular constituent in a waste stream does not cause a waste to be a listed waste nor does the lack of a detectable constituent cause a waste not to listed. Knowledge about the constituent's source shall be used to establish a listed waste designation." A second bullet states, "If no analytical data of source knowledge exists, the waste need not be designated as a listed waste." The following general comments are noted: Clarification is needed on whether the listed waste designation will be determined solely from process knowledge, since process knowledge alone may not be sufficient for this determination.	No change to the 30% design. This issue will be addressed in the RD/RA Work Plan. The listed waste determination will not be based solely on analytical data. Some knowledge of source is required for a waste to be listed.	
23)	Page 35	EDF 1551, App B - Rad Calc Methods	The assumption that the activity of daughter radionuclide with a half-life less than 10 days should be ignored if the parent has a half-life greater than the daughter is a flawed assumption. Short lived progeny can be major dose contributors for long lived radionuclides. What is the basis for this assumption? Unique knowledge of all possible radionuclides, the calculational methods	Clarification will be made in the 30% design. This assumption was deleted from the text.	

provide progeny activity contributions, etc.



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24)	Page 35	EDF 1551, App B - Rad Calc Methods	The definition of Transuranic Waste should be clarified to be consistent with common practices or the term actinides may be better. For example, how does one treat U-233, Ra-226, Th-230, etc. (i.e. non transuranic alpha-emitting nuclides with long half-lives)?	Will use DOE's definition of TRU waste for consistency. Clarification will be made to the 30% design. The first sentence of Section B.1. was revised to read: "Per DOE Order 435.1, transuranic waste is radioactive waste".	
				Control of other alpha-emitting contaminants will be based on health concerns for the workers. This issue will be addressed in the rad-con procedures for worker protection as part of the RD/RA Work Plan documentation.	



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25)**	Page 21	Treat Study Work Plan, Tables 9 through 11	These tables show treatability study formulations for various waste loadings. The rationale for the proposed testing strategy shown is unclear. Specifically, if Portland cement has a significant effect on waste stabilization, but flyash and blast furnace slag (BFS) have little or no effect, will tests be rerun with only Portland cement and sulfide? Or will tests be rerun only at what appears to be optimal waste loading? The exact testing plan should be provided. Also, explain how the relative ratios between the amendments was determined. Finally, different recipes are likely to work better or worse depending on the soil matrix/waste type; please justify using the worst-case soil matrix.	Clarification will be made in the 30% design. The text in Section 4.2.3-Soils and 4.2.4.5-CFS Surrogate Formulations has been rewritten to clarify. Cement formulations are typical of blended cements, wherein Portland cement is augmented with flyash and blast furnace slag. The sulfide dose is based on the chemistry (stoichiometry) of converting the heavy metals to non-leachable forms. An excess of sulfide is recommended to drive reaction toward completion. Text regarding the worst case soil type is undergoing revision to clarify that a high clay content soil is the most difficult to treat (difficult to bind heavy metals). If worst case soil can be treated, then it is assumed that other soils can also be treated.		
				The testing strategy is to maximize waste loading in the end product. Tests will begin at 65% waste loading, and if successful, progressively higher waste loadings will be used until failure. If failure at 65%, the mode of failure will guide subsequent tests and may require reduced waste loading (50%) or a modified formulation.		



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26)	Page 20	Treat Study Work Plan, Section 4.2.44	This section shows the surrogate composition for the proposed treatability study. Why are three different soil sources mentioned? Will soils be composited from these three INEEL sites for surrogate testing? Explain.	No change to the 30% design. As stated in the text, three surrogates will be created, one for each of the three soil sources mentioned. See Section 4.2.3 Soils, for more details.	
	Page 35.	Treat Study Work Plan, Section 15	Section 15 states that 80 TCLP samples will be analyzed. Tables 9 to 11 (page 21) show 12 different recipes for testing. Please reconcile these two apparently disparate numbers of samples, since it is unclear why 80 samples are needed to test the results of only 12 recipes.	The 80 samples in Section 15 are considered as an upper bound and were used to establish an estimated budget. Clarification was made in the 30% design. The text in the first sentence in Section 6 was changed from "60" to "80". Also in Section 4.2.4, third paragraph, the text was changed to read: "The estimated number of surrogates is based on the following:"	
28)	<u>Page B19</u>	Technical and Funct Reg'mts	This T&FR invokes 40CFR 264.172, which required compatible containers. Although this text shows that this ARAR is not applicable (N/A), it is not clear how compatible containers will be selected. Please explain.	No change to the 30% design. The expanded ARAR table shows on B-18 that 40 CFR 264.172 is applicable, and is an operations, not design issue. The SSSTF Operations Plan and related procedures will address operational issues. This was not addressed here because selecting a container is not a design issue. The ARARs table will be updated in the SSSTF Operations Plan, showing how operational ARARs are met. No change was made to the design ARAR table.	



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29)	Page B22	Treat Study Work Plan	This T&FR invokes 40 CFR 264.177, which specifies separation of containers holding incompatible wastes. 40 CFR 264.177 suggests a dike, berm, or wall separate these containers. The table shows that a combination of operations and administrative controls will result in this separation, but again, it is not clear exactly how this separation will be achieved. Please explain.	No change to the 30% design. The expanded ARAR table shows on B-18 that 40 CFR 264.172 is applicable, and is an operations, not design issue. The SSSTF Operations Plan and related procedures will address operational issues. This was not addressed here because selecting a container is not a design issue. The ARARs table will be updated in the SSSTF Operations Plan, showing how operational ARARs are met. No change was made to the design ARAR table.	